REPORT ON

LIMITED REMEDIATION ACTIVITIES

Armstrong World Industries, Inc.

St. Helens, Oregon Facility

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ST. HELENS, OREGON FACILITY

October 30, 1989

Prepared For:

Armstrong World Industries
P.O. Box 3209
Lancaster, PA 17604

Prepared By:

SRH Environmental Management
12245 N.E. Whitaker Way
Portland, Oregon 97230
(503) 252-8316

BACKGROUND

In 1987, CH2M HILL conducted an Environmental Survey of the Owens/Corning Fiberglass Plant in St. Helens, Oregon. In the report prepared by CH2M HILL subsequent to the survey, CH2M HILL identified, among other things, areas of surface spills and asphalt/naphtha-type material contamination at several locations. The survey was conducted for Armstrong World Industries (Armstrong).

Subsequent to that study in January of 1988, two groundwater monitoring wells were installed and samples were taken. The report prepared by CH2M HILL following the installation of the groundwater monitoring wells indicated that there was no significant contamination.

In 1989, during the course of the construction of Armstrong's facility in St. Helens, CH2M HILL'S report regarding the groundwater monitoring wells was submitted to the Oregon Department of Environmental Quality (DEQ). Because the DEQ had questions regarding the study and Armstrong wanted the surface contamination remediated, Armstrong contracted with SRH Environmental Management to do the following (a complete Scope of Services is presented in Appendix A):

1) Spend a day using a backhoe to excavate test pits in the area of the contaminated soils by the Quonset hut and monitoring wells to the determine horizontal extent of contamination. If allowed by the substrata, the test pits will be excavated to a minimum depth of 8 feet.

2) Obtain representative samples of the contaminated soil in accordance with EPA protocol, and conduct analysis sufficient to characterize the waste for disposal.

3) Resample the existing groundwater monitoring wells and analyze for the constituents previously analyzed for in the report dated January 7, 1988.

4) Upon receipt of the analytical results, negotiate with the DEQ a reasonable plan of action regarding additional groundwater investigation.

While SRH was conducting the above activities, several additional environmental concerns were identified:

1) An underground concrete fuel oil storage tank containing a mixture of product and water;

2) While excavating a trench used to install a water line, an apparently localized area of oil contamination was encountered at a depth of approximately 30 inches. The contamination extended for approximately 4 feet and was 8 to 12 inches thick;

3) Large piles of what appeared to be sawdust that was stored on-site appeared to be oil soaked. Reference was made by a former employee of Owens/Corning to the possibility that the sawdust may have been mixed with screenings from the Owens/Corning processes;

4) In the area of the Quonset hut and monitoring wells, heavy contamination was encountered beneath the original ground surface in the fractures of the basalts.

During the course of carrying out the original contract, SRH conducted limited investigations and remediation addressing these additional environmental concerns. This report addresses the results of these limited investigations, as well as the activities related to the original scope of services.

ORIGINAL CONTRACTED ACTIVITIES

Introduction

Armstrong World Industries currently has an area of contaminated soils in the location proposed for the installation of utility lines. In January of 1987, an environmental survey was conducted by CH2M HILL which resulted in a report addressing activities and areas of concern at the plant. A copy of the original Environmental Survey report is included in Appendix B. The conclusions of this report addressed concerns which required additional study. Subsequent to the survey, CH2M HILL installed and sampled two groundwater monitoring wells. According to a report prepared by CH2M HILL, analysis of samples from those wells indicated the absence of significant contamination.

After becoming aware of the groundwater monitoring and CH2M Hill's report, the Oregon Department of Environmental Quality (DEQ) expressed concern that sufficient groundwater investigation has not occurred.

SRH was employed to address the concerns of surface soil contamination in the area of the monitoring wells, and the possible contamination of the water present in the monitoring wells.

As discussed in the original report submitted to Armstrong by CH2M HILL, there were visible signs of spillage of an asphalt-like material around the Quonset hut. This is the area where the construction of a water and sewage line was taking place. Armstrong employed SRH to look into the general extent of this contamination and to determine the actual composition of the spilled material.

Scope of Activities

On August 23, 1989, SRH was contracted to: (1) investigate the general extent of soil contamination in the area of the Quonset hut at the Armstrong World Industries' plant located in St. Helens, Oregon, and (2) resample the existing monitoring wells and present the results to the Oregon Department of Environmental Quality. (A complete scope of services is presented in appendix A.)

Spill Area and Monitoring Well Sampling:

A backhoe was used to excavate 10 sample locations. The first three sampling areas were randomly chosen from an area downslope from, but in the vicinity of the existing monitoring wells. The samples were taken downslope from the monitoring wells to assist in determining the surface and near-surface horizontal migration of contamination. In addition, the existing monitoring wells were sampled. The locations of the sample points and the monitoring wells are presented in figure 1.

The sampling depths for the soil contamination were selected to be 1, 3, and 5 feet. These depths were chosen, because, based on the previous studies, the contamination was expected to be limited to surface and near-surface soils. However, SRH was able to sample at all three depths for only one location. For two of the locations, the backhoe encountered a thick layer of basalt at a depth of three feet. When accessible, the wells were used as stationary points for marking the locations of the sample.

Samples 1, 2 & 3 were taken downslope from the monitoring wells and the visibly contaminated area. They were obtained to demonstrate the extent of surface and near-surface horizontal migration. Sample 1 was a composite of soil taken at depths of 1, 3, and 5 feet. Samples 2 and 3 were taken at depths of 1 and 3 feet.

Sample 4 was taken from the ground surface underneath the aboveground tank that, according to the previous reports, once contained naphtha. The soil was discolored to a depth of approximately 1/4 inch at this location. The sample was taken at the 1 and 3 foot depths. At three feet, basalt was encountered.

Sample 5 was taken from the side of the road where spillage was obvious. The sampling depth was limited to 1 foot because of basalt.

Samples 6 and 7 were taken from the right side of the Quonset hut. The sampling depth for samples 6 and 7 was limited to about 1 foot because of basalt.

Sample 8 was taken from the east side of the Quonset hut.

Samples 9 and 10 were taken from sawdust piles located to the southwest of the Quonset hut.

One sample was obtained from each of the groundwater monitoring wells.

Sampling Methodolgy

Soil Sampling

The sampling plan was designed to take soil from different depths and place them into one sample container. The composite sample is then analyzed. Due to the restrictive basalt, this was not feasible at each of the sampling locations. Where feasible, composite samples were obtained. When the basalt prevented access to additional sampling points, discrete samples were obtained and analyzed.

The soil samples were obtained using a clean decontaminated stainless steel spoon and placing the sampled material directly into an 8-ounce wide-mouthed, glass sample jar with a screw cap lid fitted with a teflon liner. Sample containers were filled to maximum capacity, the lid secured in a manner to assure a proper seal of the container, and then immediately placed into a cooler containing ice for proper preservation until delivered to an off-site laboratory. Chain-of-custody documentation forms were filled out immediately after sampling and accompanied the sample to the laboratory.

Water Sampling

One sample was obtained from each of the existing monitoring wells. Developing or flushing the wells was necessary to clean the wells after drilling and prior to groundwater sampling. The wells were developed prior to each sampling using a bailer method. A volume equal to three times the volume of water in each well was removed, using a bottom-loading bailer.

The water sample was placed into the sample jar and immediately placed into a cooler containing ice for proper preservation until delivered to an off-site laboratory. Chain-of-custody documentation forms were filled out immediately after sampling and accompanied the sample to the laboratory.

Analysis and Discussion

Soil Samples

The samples were analyzed as follows:

Samples 1, 2, 3, and 9 were analyzed for solvents (EPA Method 8240).

Samples 7 & 8 were composited at the lab and likewise analyzed.

Due to the similarity in characteristics and relative location, the other samples were not immediately analyzed but were held pending the results of the conducted analysis.

Copies of the analytical results are presented in Appendix C.

Samples 1, 2, and 3 were analyzed separately. A level of 20 ppb of methylene chloride was detected in both sample 1 and 2. In sample 3, there were no contaminants detected.

The composite sample 7/8 was found to have various contaminants. The sample contained ethylbenzene at 130 ppb, 1,1,1 trichloroethane (TCA) at 120 ppb, and xylenes at 2400 ppb.

Ethylbenzene and xylenes are medium-weight hydrocarbons and are usually found in weathered gasoline mixtures. TCA can be either a constituent of a manufactured product or it can be used as a solvent as defined by 40 CFR 261. Different cleanup and disposal regulations will apply depending on the source of the TCA.

Sample 9, which was taken from the wood chip pile, also contained methylene chloride (23 ppb). This level may be attributed to lab contamination as well. It will be resampled prior to disposal.

Table 1. Soil Sample Analytical Results
(VALUES IN PPB)

	EPA METHOD 8240			
SAMPLE #	METHYLENE CHLORIDE	ETHYL BENZENE	TOLUENE	XYLENE
1	20	ND	ND	ND
2	8	ND	ND	ND
3	ND	ND	ND	ND
7/8	ND	130	120	2400
9	23	ND	ND	ND

Water Samples

To be consistent with the previous analytical work conducted, samples obtained from the monitoring wells were analyzed for solvents (EPA Method 624) and oil and grease (EPA 413.1). There were no solvents detected; however, there were elevated, but slight, levels of oil and grease present. The results of the monitoring well sampling are presented in Table 2.

Table 2. Groundwater Analytical Results
(VALUES IN PPM)

	EPA METHOD 413.1
SAMPLE #	OIL & GREASE
MW-1	2.2
MW-2	2.9
Detection Limit	0.1

Conclusions

Soil Contamination Sampling

Based on this sampling, the soil/residue contamination appeared to be limited to the spill areas. However as discussed below, when equipment suitable to break up the fractured basalt was used to explore the condition of the basalt fractures beneath the contamination, vertical migration of the contamination was discovered.

The surface contamination material should be disposed of to limit its further migration. It is important to note the that source of the TCA will be a major factor in determining the disposal method, as required by law. If the material is a federally regulated waste, the required disposal method is incineration at an EPA approved incinerator. If the TCA is strictly a constituent of a manufactured product (not used as a solvent as defined in 40 CFR 261.61), the material could then be landfilled. The ability to dispose of the waste in a local landfill will depend on the local municipalities' criteria to accept it. Even though this waste may not be regulated, many municipalities will refuse to dispose of it because future liabilities. This material may have to disposed in an EPA-approved Class 1 landfill for RCRA waste.

Arrangements are currently being made to dispose of this material at a local landfill. Final disposal will not proceed until written authorization is received from Armstrong.

The methylene chloride detected in samples 1, 2, and 9, could be attributed to lab contamination; however, upon completion of the removal of the contaminated materials, these areas will be resampled to confirm its presence.

Water Sampling

The monitoring wells' results show the presence of oil and grease in the water. While the levels are not substantial, given the other discoveries at the site (see below), an attempt to determine the source should be explored. It appears as though there may be veritical migration of petroleum contaminants through the basalt fractures.

OTHER ENVIRONMENTAL CONCERNS

Following is a summary of the results of the limited investigations and remediation addressing other identified environmental concerns.

Concrete Oil Fuel Storage Vaults

The oil and water in the fuel storage vaults was sampled for the purpose of arranging disposal. The analysis, presented in Appendix C, enabled arrangements for the disposal of the material.

During discussions with a former employee of Owens/Corning, it was revealed that the bunker oil tanks used to be filled from barges on the river. The main feeder line to the oil tanks was traced to the river and examined. There was no visual evidence of contamination observed around the feeder line.

Trench

On October 12, 1989, Mike Tomchaney of Armstrong requested that SRH evaluate contamination discovered during the excavation of a waterline trench. Samples taken revealed a level of 52,000 ppm total petroleum hydrocarbons.

Further investigation showed that the contamination followed the fire hydrant main away from the river for a limited distance. Currently the soils around the fire hydrant main toward the river are being examined. The termination point of the fire hydrant main appears to be a pump house located near the river.

There was no visible contamination in the area of the pump house.

Sawdust Piles

Two grab samples were taken from stained areas of the sawdust piles to determine if hydrocarbon contamination was present. The samples were initially analyzed for total petroleum hydrocarbons and PCB's with the intention of conducting additional analytical work if the results came back positive.

No PCB's were detected in either sample. There were 750 ppm of total petroleum hydrocarbons in one of the samples. Additional analysis is currently being conducted on that sample to characterize the type of hydrocarbons present.

Contamination in the Fractured Basalts

In the area of the Quonset hut, below the original ground surface, contamination was discovered. This contamination was discovered when in the course of conducting the remediation of the surface contamination, a trackhoe was used to break apart the fractured basalt.

The contamination observed consisted of heavily stained soils in the basalt fractures and the presence of a **very strong** hydrocarbon-solvent type odor. Samples of this material were taken and are currently being analyzed.

Thus, there is evidence that in at least one location, by the tank to the west of the Quonset hut, contamination has migrated below the surface through fractures in the basalt.

CONCLUSIONS AND RECOMMENDATIONS

Initially, one of the objectives of Armstrong was to remediate the on-site contamination that was identified in a previous environmental survey in a manner that would gain a DEQ "sign-off."

However, during the course remediating the identified contamination, several additional and potentially very large and complex, issues arose. Without a complete assessment of the site, it is unlikely that contamination present at the site can be remediated sufficient to reasonably assure that DEQ will not revisit the site at a later date. It is important that the assessment conform to current standards.

A copy of the DEQ's Environmental Cleanup Division's current Voluntary Preliminary Assessment Policy is presented in Appendix D. It is recommended that such an assessment be conducted for Armstrong's facility located in St. Helens, Oregon. By conducting such an assessment, Armstrong will avoid a continuous stream of "unpleasant surprises" and be able to better approach the DEQ with a remediation plan. Additionally, Armstrong will be able to better budget necessary investigations and remediations.

Figure 1.